

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-346846

(43)Date of publication of application : 27.12.1993

(51)Int.Cl.

G06F 9/06  
G05B 15/00

(21)Application number : 04-156726

(71)Applicant : MITSUBISHI ELECTRIC CORP

(22)Date of filing : 16.06.1992

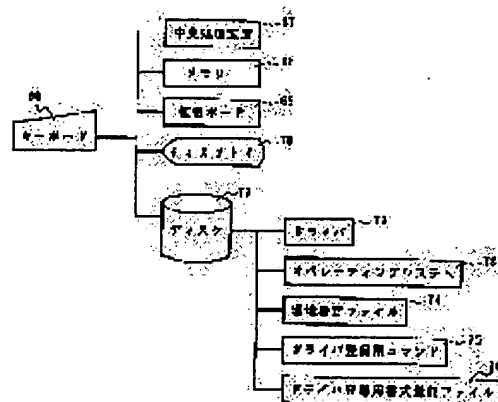
(72)Inventor : OGISO TOSHIHIKO

## (54) DRIVER REGISTERING METHOD FOR FA CONTROLLER

### (57)Abstract:

**PURPOSE:** To prevent device setting sentence registration error for starting a driver by executing a command for driver registration from a command line on an operating system and adding a device setting sentence for starting the driver to an environment setting file in the case of registration to the environment setting file of the driver at an FA controller.

**CONSTITUTION:** In the case of the registration to an environment setting file 74 of the driver at the FA controller, the command for driver registration is executed from the command line on an operating system 73 so as to read driver registration information from the board information write memory of an extended board 69 and to add the registration setting sentence for starting the driver to the environment setting file 74. Concerning the command 75 for driver registration, it is discriminated whether the command is overlapped with the other extended board setting information or not, etc., in the case of error, an error message is displayed, and the error message is written in the registration setting sentence insertion scheduled line for driver start of the environment setting file 74.



## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

CLAIMS

---

[Claim(s)]

[Claim 1] The driver registration approach of FA controller characterized by adding a driver starting setting sentence on a configuration file on the occasion of the registration to the a configuration file of the driver in FA controller by executing the command for driver registration from the command line on an operating system.

[Claim 2] The driver registration approach of FA controller according to claim 1 characterized by writing a message in said configuration file while displaying a message on a screen, when the board information stored in the memory of an add-in board by said command for driver registration is read, it judges whether there is any duplication to other board information and it is judged that there is duplication.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

## DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the driver registration approach of FA controller of setting registration of the driver of the add-in board set to the extended I/O slot in FA controller as a configuration file, and performing it.

[0002]

[Description of the Prior Art] Drawing 8 is the block diagram showing the outline configuration of an add-in board and FA controller in FA controller. The keyboard into which 66 inputs various signals in drawing, the central processing unit with which 67 performs various data processing, The add-in board with which 68 controls memory and 69 controls commo data, and 70 display. The driver by which 71 controls a disk and 72 controls transmission and reception of the data of an add-in board 69 and FA controller, The a configuration file to which 73 sets an operating system and 74 sets the operating environment of FA controller, The command for driver registration with which 75 registers a driver into a configuration file 74 according to the format for driver starting, and 76 are format catalogued files for driver registration which register the format for driver starting.

[0003] Drawing 9 is the switch configuration of an add-in board 69. In drawing, it is the memory in which the interrupt number configuration switch to which 78 sets a board number configuration switch, and 79 sets the interrupt priority to an add-in board 69, the address selection switch whose 80 sets up an interrupt address, and 81-83 write the configuration switch of others, such as for example, a code setup for a communication link, and 84 writes the switch setting information to 78-83.

[0004] In drawing 8, after performing a setup of the board number configuration switch 78, the interrupt number configuration switch 79, the address selection switch 80, and the other configuration switches 81-83, the power source of FA controller is switched on and it starts by reading the system file of an operating system 73 from a disk 71 to memory 68, and a configuration file 74 is read from a disk 71, and a driver 72 is started according to the sequence of being written to a configuration file 74. For example, the started drivers 72, such as a driver for a communication link, a mouse driver, and a driver for expanded memories, play the role of an interface, when exchanging the data of FA controller and an add-in board 69.

[0005] Drawing 10 is a flow chart which shows the conventional driver registration approach in FA controller. First, it judges whether an operator adds an add-in board 69 (S85). When it is judged that an add-in board 69 is added, an operator does a setup of the switch of an add-in board 69, and the check of the set point (S86). Next, after switching on the power source of FA controller, an operating system 73 is started (S87), in order that FA controller may start a driver 72, a configuration file 74 is read (S88), and the driver 72 for using the added add-in board 69 for a communication link is started (S89).

[0006] Then, when it judges whether the driver 72 for communication boards is registered, or it started normally (S90) and it is judged that it has not started normally, a configuration file 74 is read by the editor (S91). Next, a driver setting sentence is inserted in a configuration file 74 according to driver registration format (S92). Then, an operator writes in a configuration file 74 and ends a back editor (S93). And FA controller is reset in order that an operator may start a driver 72 (S94). Then, an operator judges whether the communication link driver started normally (S95), and when it is judged that it has not started normally, the power source of FA controller is dropped (S96). When it is judged that it has started normally on the contrary, a series of processings are ended.

[0007] In addition, "the simple communication environment setting device in document preparation equipment" currently indicated by JP,61-156951,A as reference technical reference relevant to this invention, The "communication link trial method" currently indicated by JP,2-159142,A, The "disk cache control system" currently indicated by JP,2-28851,A, "The configuration method of a virtual machine of operation" currently indicated by JP,1-103745,A, There

are an "online environmental-information setting method" currently indicated by JP,3-5865,A and an "on-line system operating environment automatic listing device" currently indicated by JP,3-116354,A.

[0008]

[Problem(s) to be Solved by the Invention] If it is in the registration to the a configuration file of the driver in FA controller in the former Since the editor was started on the operating system, a configuration file was read and the device setting sentence for driver registration was driven in by manual input from a keyboard, The input-statement character spacing difference and the operator did the read difference in the switch information on an add-in board, there was a possibility that the mistaken information might be used at the time of registration of the driver to a configuration file, consequently there was a trouble that a driver was not started.

[0009] In case this invention is made in order to solve the above troubles, and it carries out the specification of the FA controller, it mitigates an operator's activity burden and aims at acquiring the driver registration approach of FA controller which can eliminate the registration mistake to the a configuration file of a driver.

[0010]

[Means for Solving the Problem] The driver registration approach of FA controller concerning this invention adds a driver starting setting sentence on a configuration file on the occasion of the registration to the a configuration file of the driver in FA controller by executing the command for driver registration from the command line on an operating system.

[0011] Moreover, when the board information stored in the memory of an add-in board by said command for driver registration is read, it judges whether there is any duplication to other board information and it is judged that there is duplication, while displaying a message on a screen, a message is written in said configuration file.

[0012]

[Function] As mentioned above, on the occasion of the registration to the a configuration file of the driver in FA controller, by executing the command for driver registration from the command line on an operating system, driver registration information is read from the board information write-in memory of an add-in board, and the registration setting sentence for driver starting is added to a configuration file.

[0013] Moreover, by the command for driver registration, while distinguishing whether there is any duplication to other add-in board setting information and displaying an error message on a screen in an error, the error message generated in the registration setting sentence insertion schedule line for driver starting of a configuration file is written in.

[0014]

[Example] The example of this invention is explained about drawing. Drawing 1 R> 1 is the I/O map of the data table 1 prepared for the memory 84 of an add-in board 69. In the data table 1, the code with which 2 expresses the class of add-in board 69 is set up, 3 expresses a setup of an interruption level, memory and an I/O Address, and an I/O field with bit information, and the information on the configuration switches 78-80 of an add-in board 69 is assigned to each bit of 2-byte data. An interruption level expresses the height of the interrupt priority to an add-in board 69 from FA controller, memory and an I/O Address set up the address used when data are transmitted or an applique SHOMBU log ram receives to an add-in board 69, and a setup of an I/O field shows the address of the I/O Port which delivers hardware information on an operating system 73 and the add-in boards 69, such as a model code.

[0015] Drawing 2 is a flow chart which shows the registration procedure to the a configuration file 74 of a driver 72. In drawing 2, when it judges first whether an operator adds an add-in board 69 and it is judged that addition of (S4) and an add-in board 69 is performed, an operator performs a setup of the switch of an add-in board 69, and the check of the set point (S5), and the power source of FA controller is switched on after that (S6). Next, an operating system 73 is started (S7), and in order to start a driver 72, a configuration file 74 is read (S8). And a driver 72 is started, (S9) and an operator new-register a driver 72 into a configuration file 74, and it judges whether it starts or not (S10). It judges whether when a driver 72 was not started, a series of processings were ended, when a driver 72 was started on the contrary, the command 75 for driver registration was executed (S11), next the command 75 for driver registration was completed normally (S12). When it is judged that the driver 72 is registered correctly and there is (the command 75 for driver registration is not completed normally), [ no ] Drop the power source of FA controller (S13), and it redoes from a setup of the switch of the add-in board 69 of the above-mentioned step 5. When it is judged on the contrary that the driver 72 is registered correctly (the command 75 for driver registration was completed normally), in order to start a driver 72, FA controller is reset and a configuration file 74 is read (S14).

[0016] Drawing 3 (a) shows the example of the format catalogued file 76 for driver registration. In drawing, 15-17 are the format for driver registration with the need of writing in the set point of an add-in board 69. 18 is the sequence number in case the same driver 72 exists, 19 is the interrupt address of a driver 72, 20 is the pathname of a driver 72,

and a file name, 21 is a software interrupt number, 22 is an add-in board number, 23 is the hardware interrupt number of an add-in board 69, and 24 is an interrupt address.

[0017] Drawing 3 (b) is the example of the a configuration file 74 rewritten by executing a driver registration command. In drawing, 25-37 are the registration format of the driver 72 usually written in a configuration file 74, 32 is the example into which the driver registration command terminated normally and the driver 72 was registered normally, 33 is the example in which the error detected during driver registration command activation was written, 34 is an error name and 35 is an error part. Moreover, 36 and 37 show the duplication part of an error.

[0018] In Example 32 by which board information was written in the part of "\#" of the format 17 read from the above-mentioned format catalogued file 76 for driver registration Are and the value of the low order triplet of the interruption level 3 of a data table 1 is assigned to the add-in board number 22. 4 of the memory and I/O Address 3 of a data table 1 and the value of 5 or 6 bits are assigned to the hardware interrupt number 23 of an add-in board 69, and the value of 2 bits of high orders of the interruption level 3 of a data table 1 is assigned to an interrupt address 24. Since the add-in board interrupt number in board information overlapped other interrupt numbers when it was going to register a driver 72 into a configuration file 74 using the format 16 read from the format catalogued file 76 for driver registration, the above 33 is the example in which the error message was written by a configuration file 74.

[0019] Drawing 4 is a flow chart which shows the activation procedure of the command 75 for driver registration. In drawing, when it is judged that it judges whether the format for driver registration is registered (S38), and registers, registration format is inputted from a keyboard 66 and it saves to a file (S39). When it is judged on the contrary that it does not register, read the information 2 and 3 in the data table 1 required for starting of a driver 72 from the memory 84 of an add-in board 69, the memory 68 of FA controller is made to memorize (S40), and count loop-formation processing for number of sheets of an add-in board 69 is performed. Next, the board setting information memorized by the memory 68 of FA controller is investigated, when it judges whether duplication to other board information is (S41) and it is judged that it overlaps, while carrying out a screen display of the error message, an error message is written in a configuration file 74 (S42), and the character string formed into driver registration format is further written in a configuration file 74 (S46).

[0020] In the above-mentioned step 41, it judges whether when it is judged that it does not overlap, the error message is written to a configuration file 74 (S43), and when it is judged as the case where the error message is written, the error message written in a configuration file 74 last time is deleted (S44). Next, stored information is used for the memory 68 of FA controller, the character string which is character-string-ized according to the registration format of a driver 72 and which was carried out and (S45) formed into driver registration format is written in a configuration file 74 (S46), and when it is judged that the number-of-sheets part loop formation of whether the add-in board 69 carried out the number-of-sheets part loop formation was judged and (S47) carried out further, a series of processings are ended. When it is judged on the contrary that a number-of-sheets part loop formation has not been carried out, processing is repeated after returning to step 41.

[0021] Drawing 5 is a flow chart which shows the procedure which reads the information 2 and 3 required for starting of a driver 72 from the memory 84 of an add-in board 69, and the memory 68 of FA controller is made to memorize. First, 0000H are set as the retrieval initiation board address of an add-in board 69 (S48). On the memory 68 of FA controller, the model code 2, an interruption level, memory and an I/O Address, When the field which saves I/O field 3 is secured (S49), it judges whether an add-in board 69 exists in the board address point for retrieval (S50) and it is judged that it exists The model code 2, an interruption level, a memory I/O Address, and I/O field 3 are read from the memory 84 of an add-in board 69, and it saves to the field secured to the memory 68 of FA controller (S51). When it is judged on the contrary that an add-in board 69 does not exist, it shifts to step 52. Here, when 100H are added to the retrieval board address of an add-in board 69 (S52), it judges whether the retrieval board address of an add-in board 69 is 8000H (S53) and it is judged that it is 8000H, the address of the field secured to memory 68 is returned (S54), and a series of processings are ended. When it is judged on the contrary that it is not 8000H, return and subsequent steps are performed to the above-mentioned step 49.

[0022] Drawing 6 is a flow chart which shows the procedure which uses stored information for the memory 68 of FA controller, and is character-string-ized according to the registration format of a driver 72. In drawing, the model code which reads first the data saved to memory 68 by one board (S55), next has been written on the head of the format for driver registration written to the format catalogued file 76 for driver registration is searched, and the same format for driver registration as the model code of the board data on memory 84 is read (S56). Next, the memory and the I/O setting number of the board data on memory 84 are character-string-ized to \#27 of the beginning in the format for driver registration, and it adds to them after a pathname 25 (S57). Next, the interruption-level number on memory 84 is

character-string-ized to the 2nd \#28 in the format for driver registration, and it adds after the character string created by the above-mentioned processing (S58). Then, the setting number of the I/O field on memory 84 is character-string-ized to the 3rd \#29 in the format for driver registration, it adds after the character string created by the above-mentioned processing (S59), and a series of processings are ended.

[0023] Drawing 7 is a flow chart which shows the procedure which carries out a screen display of the error message, and writes an error message in a configuration file 74. First, the model code currently written on the head of the format for driver registration written to the format catalogued file 76 for driver registration is searched, and the same format for driver registration as the model code of the board data on the duplicate memory 84 is read (S60). Then, when it judges which part of board data overlaps (S61) and it is judged that it is an interruption-level value, the interruption-level value of the board data on the duplicate memory 84 is read, and an error message 32 is performed (S62).

Moreover, when it is judged that they are memory and an I/O Address value, the memory and the I/O Address value of the board data on the duplicate memory 84 are read, and it takes error message 29 (S63). Furthermore, when it is judged that it is an I/O-field value, the I/O-field value of the board data on the duplicate memory 84 is read, and it takes error message 32 (S64). Then, in order that the displayed error may clarify whether it generated in the part of a-configuration-file 74 throat, an error message is written in a configuration file (S65), and a series of processings are ended.

[0024]

[Effect of the Invention] This invention is executing the command for driver registration from the command line on an operating system on the occasion of the registration to the a configuration file of the driver in FA controller as explained above. Since information required for the driver registration currently written to the memory of an add-in board is read and the device setting sentence for driver starting was added to a configuration file The mistranslation of the switch of an add-in board is lost, and since direct character string insertion to the a configuration file by the editor was made unnecessary, it is effective in the device setting sentence registration mistake for driver starting being lost.

[0025] Moreover, since an error message is written also in a configuration file while being able to \*\*\*\* since a screen display of the error message is carried out when the add-in board setting information under driver registration overlaps other add-in board setting information, there is effectiveness which can perform easily the check of a setting mistake of an add-in board switch by starting an editor and reading a configuration file.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

TECHNICAL FIELD

---

[Industrial Application] This invention relates to the driver registration approach of FA controller of setting registration of the driver of the add-in board set to the extended I/O slot in FA controller as a configuration file, and performing it.

---

[Translation done.]



\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

PRIOR ART

---

[Description of the Prior Art] Drawing 8 is the block diagram showing the outline configuration of an add-in board and FA controller in FA controller. The keyboard into which 66 inputs various signals in drawing, the central processing unit with which 67 performs various data processing, The add-in board with which 68 controls memory and 69 controls commo data, and 70 display. The driver by which 71 controls a disk and 72 controls transmission and reception of the data of an add-in board 69 and FA controller, The a configuration file to which 73 sets an operating system and 74 sets the operating environment of FA controller, The command for driver registration with which 75 registers a driver into a configuration file 74 according to the format for driver starting, and 76 are format catalogued files for driver registration which register the format for driver starting.

[0003] Drawing 9 is the switch configuration of an add-in board 69. In drawing, it is the memory in which the interrupt number configuration switch to which 78 sets a board number configuration switch, and 79 sets the interrupt priority to an add-in board 69, the address selection switch whose 80 sets up an interrupt address, and 81-83 write the configuration switch of others, such as for example, a code setup for a communication link, and 84 writes the switch setting information to 78-83.

[0004] In drawing 8, after performing a setup of the board number configuration switch 78, the interrupt number configuration switch 79, the address selection switch 80, and the other configuration switches 81-83, the power source of FA controller is switched on and it starts by reading the system file of an operating system 73 from a disk 71 to memory 68, and a configuration file 74 is read from a disk 71, and a driver 72 is started according to the sequence of being written to a configuration file 74. For example, the started drivers 72, such as a driver for a communication link, a mouse driver, and a driver for expanded memories, play the role of an interface, when exchanging the data of FA controller and an add-in board 69.

[0005] Drawing 10 is a flow chart which shows the conventional driver registration approach in FA controller. First, it judges whether an operator adds an add-in board 69 (S85). When it is judged that an add-in board 69 is added, an operator does a setup of the switch of an add-in board 69, and the check of the set point (S86). Next, after switching on the power source of FA controller, an operating system 73 is started (S87), in order that FA controller may start a driver 72, a configuration file 74 is read (S88), and the driver 72 for using the added add-in board 69 for a communication link is started (S89).

[0006] Then, when it judges whether the driver 72 for communication boards is registered, or it started normally (S90) and it is judged that it has not started normally, a configuration file 74 is read by the editor (S91). Next, a driver setting sentence is inserted in a configuration file 74 according to driver registration format (S92). Then, an operator writes in a configuration file 74 and ends a back editor (S93). And FA controller is reset in order that an operator may start a driver 72 (S94). Then, an operator judges whether the communication link driver started normally (S95), and when it is judged that it has not started normally, the power source of FA controller is dropped (S96). When it is judged that it has started normally on the contrary, a series of processings are ended.

[0007] In addition, "the simple communication environment setting device in document preparation equipment" currently indicated by JP,61-156951,A as reference technical reference relevant to this invention, The "communication link trial method" currently indicated by JP,2-159142,A, The "disk cache control system" currently indicated by JP,2-28851,A, "The configuration method of a virtual machine of operation" currently indicated by JP,1-103745,A, There are an "online environmental-information setting method" currently indicated by JP,3-5865,A and an "on-line system operating environment automatic listing device" currently indicated by JP,3-116354,A.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

EFFECT OF THE INVENTION

---

[Effect of the Invention] This invention is executing the command for driver registration from the command line on an operating system on the occasion of the registration to the a configuration file of the driver in FA controller as explained above. Since information required for the driver registration currently written to the memory of an add-in board is read and the device setting sentence for driver starting was added to a configuration file The mistranslation of the switch of an add-in board is lost, and since direct character string insertion to the a configuration file by the editor was made unnecessary, it is effective in the device setting sentence registration mistake for driver starting being lost. [0025] Moreover, since an error message is written also in a configuration file while being able to \*\*\*\* since a screen display of the error message is carried out when the add-in board setting information under driver registration overlaps other add-in board setting information, there is effectiveness which can perform easily the check of a setting mistake of an add-in board switch by starting an editor and reading a configuration file.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

EFFECT OF THE INVENTION

---

[Effect of the Invention] This invention is executing the command for driver registration from the command line on an operating system on the occasion of the registration to the a configuration file of the driver in FA controller as explained above. Since information required for the driver registration currently written to the memory of an add-in board is read and the device setting sentence for driver starting was added to a configuration file The mistranslation of the switch of an add-in board is lost, and since direct character string insertion to the a configuration file by the editor was made unnecessary, it is effective in the device setting sentence registration mistake for driver starting being lost. [0025] Moreover, since an error message is written also in a configuration file while being able to \*\*\*\* since a screen display of the error message is carried out when the add-in board setting information under driver registration overlaps other add-in board setting information, there is effectiveness which can perform easily the check of a setting mistake of an add-in board switch by starting an editor and reading a configuration file.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

TECHNICAL PROBLEM

---

[Problem(s) to be Solved by the Invention] If it is in the registration to the a configuration file of the driver in FA controller in the former Since the editor was started on the operating system, a configuration file was read and the device setting sentence for driver registration was driven in by manual input from a keyboard, The input-statement character spacing difference and the operator did the read difference in the switch information on an add-in board, there was a possibility that the mistaken information might be used at the time of registration of the driver to a configuration file, consequently there was a trouble that a driver was not started.

[0009] In case this invention is made in order to solve the above troubles, and it carries out the specification of the FA controller, it mitigates an operator's activity burden and aims at acquiring the driver registration approach of FA controller which can eliminate the registration mistake to the a configuration file of a driver.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

MEANS

---

[Means for Solving the Problem] The driver registration approach of FA controller concerning this invention adds a driver starting setting sentence on a configuration file on the occasion of the registration to the a configuration file of the driver in FA controller by executing the command for driver registration from the command line on an operating system.

[0011] Moreover, when the board information stored in the memory of an add-in board by said command for driver registration is read, it judges whether there is any duplication to other board information and it is judged that there is duplication, while displaying a message on a screen, a message is written in said configuration file.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

OPERATION

---

[Function] As mentioned above, on the occasion of the registration to the a configuration file of the driver in FA controller, by executing the command for driver registration from the command line on an operating system, driver registration information is read from the board information write-in memory of an add-in board, and the registration setting sentence for driver starting is added to a configuration file.

[0013] Moreover, by the command for driver registration, while distinguishing whether there is any duplication to other add-in board setting information and displaying an error message on a screen in an error, the error message generated in the registration setting sentence insertion schedule line for driver starting of a configuration file is written in.

---

[Translation done.]

## \* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## EXAMPLE

[Example] The example of this invention is explained about drawing. Drawing 1 R> 1 is the I/O map of the data table 1 prepared for the memory 84 of an add-in board 69. In the data table 1, the code with which 2 expresses the class of add-in board 69 is set up, 3 expresses a setup of an interruption level, memory and an I/O Address, and an I/O field with bit information; and the information on the configuration switches 78-80 of an add-in board 69 is assigned to each bit of 2-byte data. An interruption level expresses the height of the interrupt priority to an add-in board 69 from FA controller, memory and an I/O Address set up the address used when data are transmitted or an applique SHOMBU log ram receives to an add-in board 69, and a setup of an I/O field shows the address of the I/O Port which delivers hardware information on an operating system 73 and the add-in boards 69, such as a model code.

[0015] Drawing 2 is a flow chart which shows the registration procedure to the a configuration file 74 of a driver 72. In drawing 2, when it judges first whether an operator adds an add-in board 69 and it is judged that addition of (S4) and an add-in board 69 is performed, an operator performs a setup of the switch of an add-in board 69, and the check of the set point (S5), and the power source of FA controller is switched on after that (S6). Next, an operating system 73 is started (S7), and in order to start a driver 72, a configuration file 74 is read (S8). And a driver 72 is started, (S9) and an operator new-register a driver 72 into a configuration file 74, and it judges whether it starts or not (S10). It judges whether when a driver 72 was not started, a series of processings were ended, when a driver 72 was started on the contrary, the command 75 for driver registration was executed (S11), next the command 75 for driver registration was completed normally (S12). When it is judged that the driver 72 is registered correctly and there is (the command 75 for driver registration is not completed normally), [ no ] Drop the power source of FA controller (S13), and it redoes from a setup of the switch of the add-in board 69 of the above-mentioned step 5. When it is judged on the contrary that the driver 72 is registered correctly (the command 75 for driver registration was completed normally), in order to start a driver 72, FA controller is reset and a configuration file 74 is read (S14).

[0016] Drawing 3 (a) shows the example of the format catalogued file 76 for driver registration. In drawing, 15-17 are the format for driver registration with the need of writing in the set point of an add-in board 69. 18 is the sequence number in case the same driver 72 exists, 19 is the interrupt address of a driver 72, 20 is the pathname of a driver 72, and a file name, 21 is a software interrupt number, 22 is an add-in board number, 23 is the hardware interrupt number of an add-in board 69, and 24 is an interrupt address.

[0017] Drawing 3 (b) is the example of the a configuration file 74 rewritten by executing a driver registration command. In drawing, 25-37 are the registration format of the driver 72 usually written in a configuration file 74, 32 is the example into which the driver registration command terminated normally and the driver 72 was registered normally, 33 is the example in which the error detected during driver registration command activation was written, 34 is an error name and 35 is an error part. Moreover, 36 and 37 show the duplication part of an error.

[0018] In Example 32 by which board information was written in the part of "#/" of the format 17 read from the above-mentioned format catalogued file 76 for driver registration Are and the value of the low order triplet of the interruption level 3 of a data table 1 is assigned to the add-in board number 22. 4 of the memory and I/O Address 3 of a data table 1 and the value of 5 or 6 bits are assigned to the hardware interrupt number 23 of an add-in board 69, and the value of 2 bits of high orders of the interruption level 3 of a data table 1 is assigned to an interrupt address 24. Since the add-in board interrupt number in board information overlapped other interrupt numbers when it was going to register a driver 72 into a configuration file 74 using the format 16 read from the format catalogued file 76 for driver registration, the above 33 is the example in which the error message was written by a configuration file 74.

[0019] Drawing 4 is a flow chart which shows the activation procedure of the command 75 for driver registration. In drawing, when it is judged that it judges whether the format for driver registration is registered (S38), and registers, registration format is inputted from a keyboard 66 and it saves to a file (S39). When it is judged on the contrary that it

does not register, read the information 2 and 3 in the data table 1 required for starting of a driver 72 from the memory 84 of an add-in board 69, the memory 68 of FA controller is made to memorize (S40), and count loop-formation processing for number of sheets of an add-in board 69 is performed. Next, the board setting information memorized by the memory 68 of FA controller is investigated, when it judges whether duplication to other board information is (S41) and it is judged that it overlaps, while carrying out a screen display of the error message, an error message is written in a configuration file 74 (S42), and the character string formed into driver registration format is further written in a configuration file 74 (S46).

[0020] In the above-mentioned step 41, it judges whether when it is judged that it does not overlap, the error message is written to a configuration file 74 (S43), and when it is judged as the case where the error message is written, the error message written in a configuration file 74 last time is deleted (S44). Next, stored information is used for the memory 68 of FA controller, the character string which is character-string-ized according to the registration format of a driver 72 and which was carried out and (S45) formed into driver registration format is written in a configuration file 74 (S46), and when it is judged that the number-of-sheets part loop formation of whether the add-in board 69 carried out the number-of-sheets part loop formation was judged and (S47) carried out further, a series of processings are ended. When it is judged on the contrary that a number-of-sheets part loop formation has not been carried out, processing is repeated after returning to step 41.

[0021] Drawing 5 is a flow chart which shows the procedure which reads the information 2 and 3 required for starting of a driver 72 from the memory 84 of an add-in board 69, and the memory 68 of FA controller is made to memorize. First, 0000H are set as the retrieval initiation board address of an add-in board 69 (S48). On the memory 68 of FA controller, the model code 2, an interruption level, memory and an I/O Address, When the field which saves I/O field 3 is secured (S49), it judges whether an add-in board 69 exists in the board address point for retrieval (S50) and it is judged that it exists. The model code 2, an interruption level, a memory I/O Address, and I/O field 3 are read from the memory 84 of an add-in board 69, and it saves to the field secured to the memory 68 of FA controller (S51). When it is judged on the contrary that an add-in board 69 does not exist, it shifts to step 52. Here, when 100H are added to the retrieval board address of an add-in board 69 (S52), it judges whether the retrieval board address of an add-in board 69 is 8000H (S53) and it is judged that it is 8000H, the address of the field secured to memory 68 is returned (S54), and a series of processings are ended. When it is judged on the contrary that it is not 8000H, return and subsequent steps are performed to the above-mentioned step 49.

[0022] Drawing 6 is a flow chart which shows the procedure which uses stored information for the memory 68 of FA controller, and is character-string-ized according to the registration format of a driver 72. In drawing, the model code which reads first the data saved to memory 68 by one board (S55), next has been written on the head of the format for driver registration written to the format catalogued file 76 for driver registration is searched, and the same format for driver registration as the model code of the board data on memory 84 is read (S56). Next, the memory and the I/O setting number of the board data on memory 84 are character-string-ized to \#27 of the beginning in the format for driver registration, and it adds to them after a pathname 25 (S57). Next, the interruption-level number on memory 84 is character-string-ized to the 2nd \#28 in the format for driver registration, and it adds after the character string created by the above-mentioned processing (S58). Then, the setting number of the I/O field on memory 84 is character-string-ized to the 3rd \#29 in the format for driver registration, it adds after the character string created by the above-mentioned processing (S59), and a series of processings are ended.

[0023] Drawing 7 is a flow chart which shows the procedure which carries out a screen display of the error message, and writes an error message in a configuration file 74. First, the model code currently written on the head of the format for driver registration written to the format catalogued file 76 for driver registration is searched, and the same format for driver registration as the model code of the board data on the duplicate memory 84 is read (S60). Then, when it judges which part of board data overlaps (S61) and it is judged that it is an interruption-level value, the interruption-level value of the board data on the duplicate memory 84 is read, and an error message 32 is performed (S62). Moreover, when it is judged that they are memory and an I/O Address value, the memory and the I/O Address value of the board data on the duplicate memory 84 are read, and it takes error message 29 (S63). Furthermore, when it is judged that it is an I/O-field value, the I/O-field value of the board data on the duplicate memory 84 is read, and it takes error message 32 (S64). Then, in order that the displayed error may clarify whether it generated in the part of a configuration-file 74 throat, an error message is written in a configuration file (S65), and a series of processings are ended.



[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

## DESCRIPTION OF DRAWINGS

---

### [Brief Description of the Drawings]

[Drawing 1] It is the explanatory view showing the configuration of the board information table written in the memory of the add-in board in this invention.

[Drawing 2] It is the flow chart which shows the registration procedure to the a configuration file of the driver in this invention.

[Drawing 3] It is the explanatory view showing the example for driver registration of a format catalogued file and the example of a configuration file in this invention.

[Drawing 4] It is the flow chart which shows the procedure of the command which performs registration to the a configuration file of the driver in this invention.

[Drawing 5] It is the flow chart which shows the procedure which reads information required for starting of a driver from the memory of the board in this invention, and the memory of FA controller is made to memorize.

[Drawing 6] It is the flow chart which shows the procedure character-string-ized according to the registration format of a driver using stored information in the memory of FA controller in this invention.

[Drawing 7] It is the flow chart which shows the procedure which carries out a screen display of the error message at the time of the driver registration command activation in this invention, and writes an error message in a configuration file.

[Drawing 8] It is the block diagram showing the outline configuration of the add-in board in FA controller and FA controller.

[Drawing 9] It is the explanatory view showing the switch configuration of the add-in board shown in drawing 8 .

[Drawing 10] It is the flow chart which shows the driver registration approach of FA controller in the former.

### [Description of Notations]

1 Board Information Table Written in Memory of Add-in Board

2 Model Code

3 Interruption Level, Memory and I/O Address, I/O Field

66 Keyboard

67 Central Processing Unit

68 Memory

69 Add-in Board

70 Display

71 Disk

72 Driver

73 Operating System

74 Configuration File

75 Command for Driver Registration

76 Format Catalogued File for Driver Registration

78 Board Number Configuration Switch

79 Interrupt Number Configuration Switch

80 Address Selection Switch

84 Memory

---

[Translation done.]

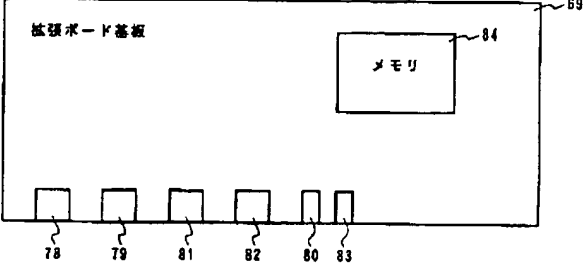
\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

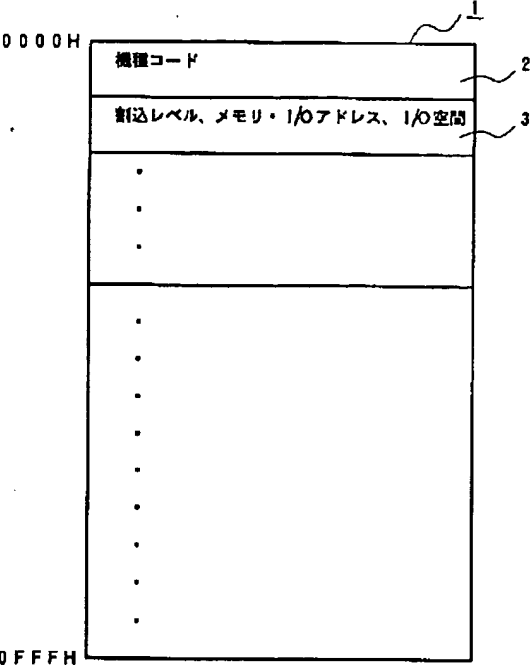
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 9]



[Drawing 1]



[Drawing 3]

(a)

1 EDh c:¥rrt.sys int-a50 bd¥# int-b¥# ¥#h ~ 15  
 1 EEh c:¥netx.sys int-a20 bd¥# int-b¥# ¥#h ~ 16  
 2 EEh c:¥netx.sys int-a60 bd¥# int-b¥# ¥#h ~ 17

18 19 20 21 22 23 24

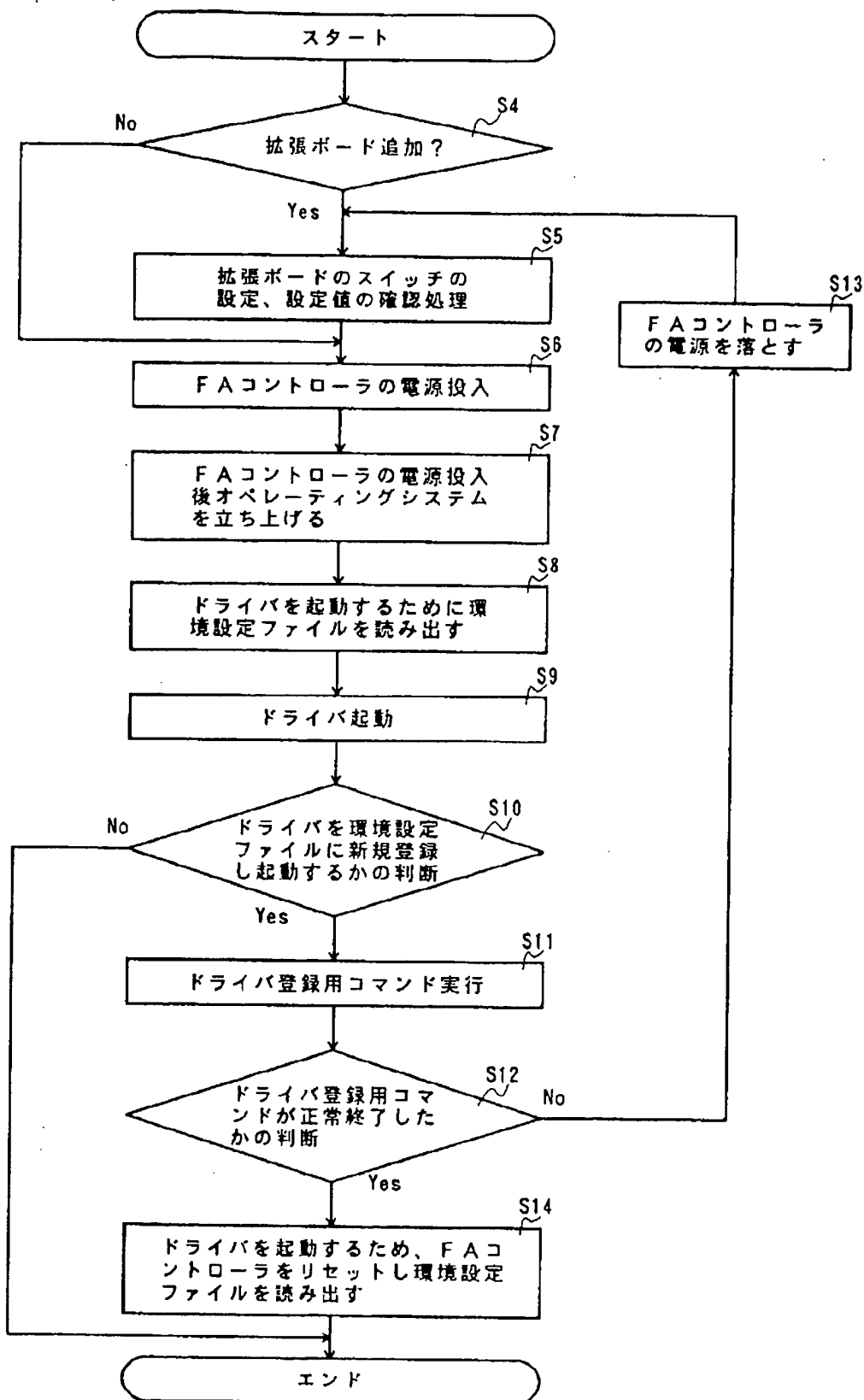
(b)

files=20 ~ 25  
 buffers=15 ~ 26  
 device=c:¥dev¥jega.sys ~ 27  
 device=c:¥dev¥keybjpn.sys ~ 28  
 device=c:¥dev¥ansij.sys ~ 29  
 device=c:¥dev¥xdisk.sys c:2 ~ 30  
 device=c:¥dev¥mouse.sys ~ 31  
 device=c:¥netx.sys int-a60 bd0 int-b0 100h ~ 32  
 duplication error int-b0? ~ 33

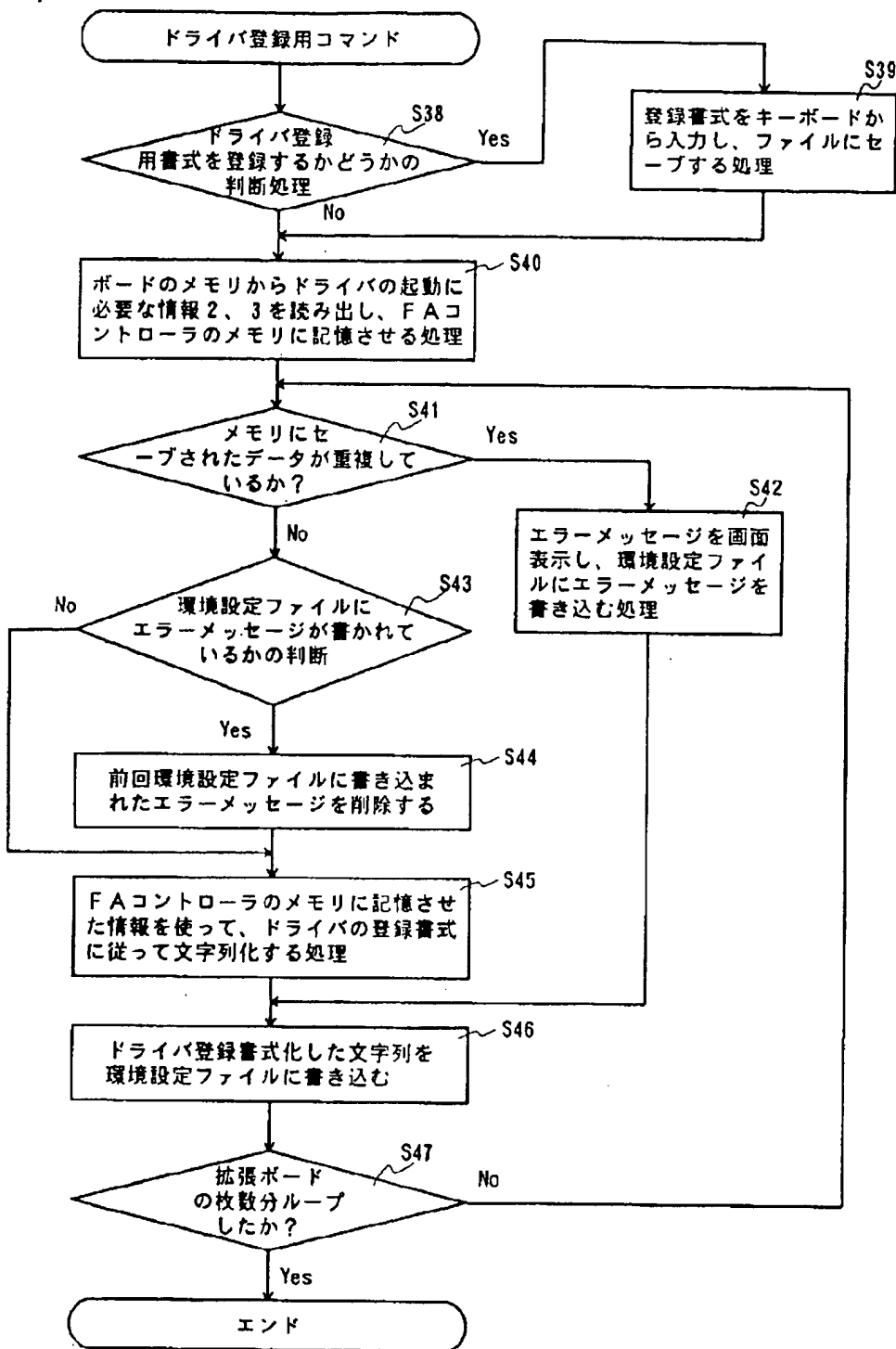
34 35

duplication error bd0? ~ 36  
 duplication error 100h? ~ 37

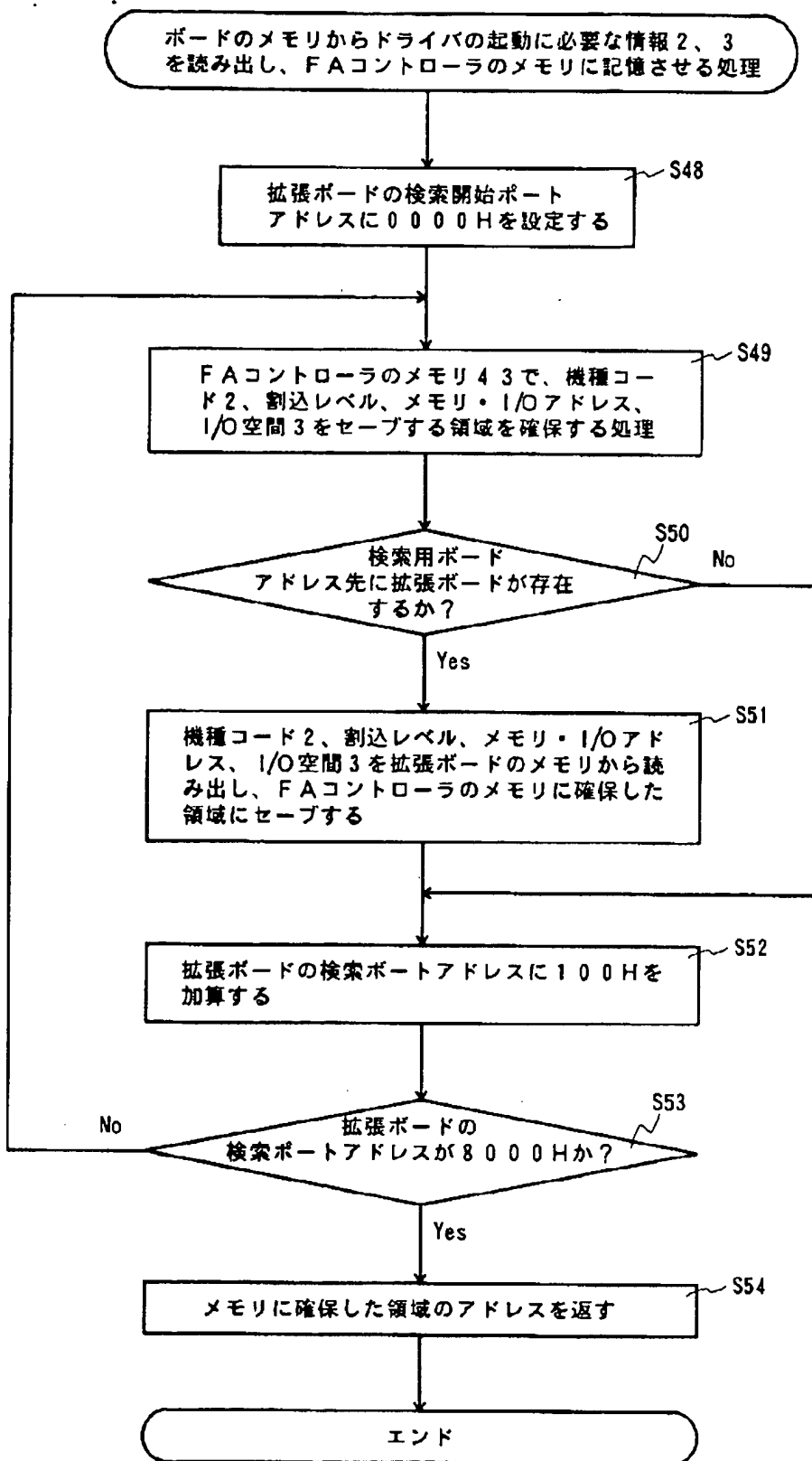
[Drawing 2]



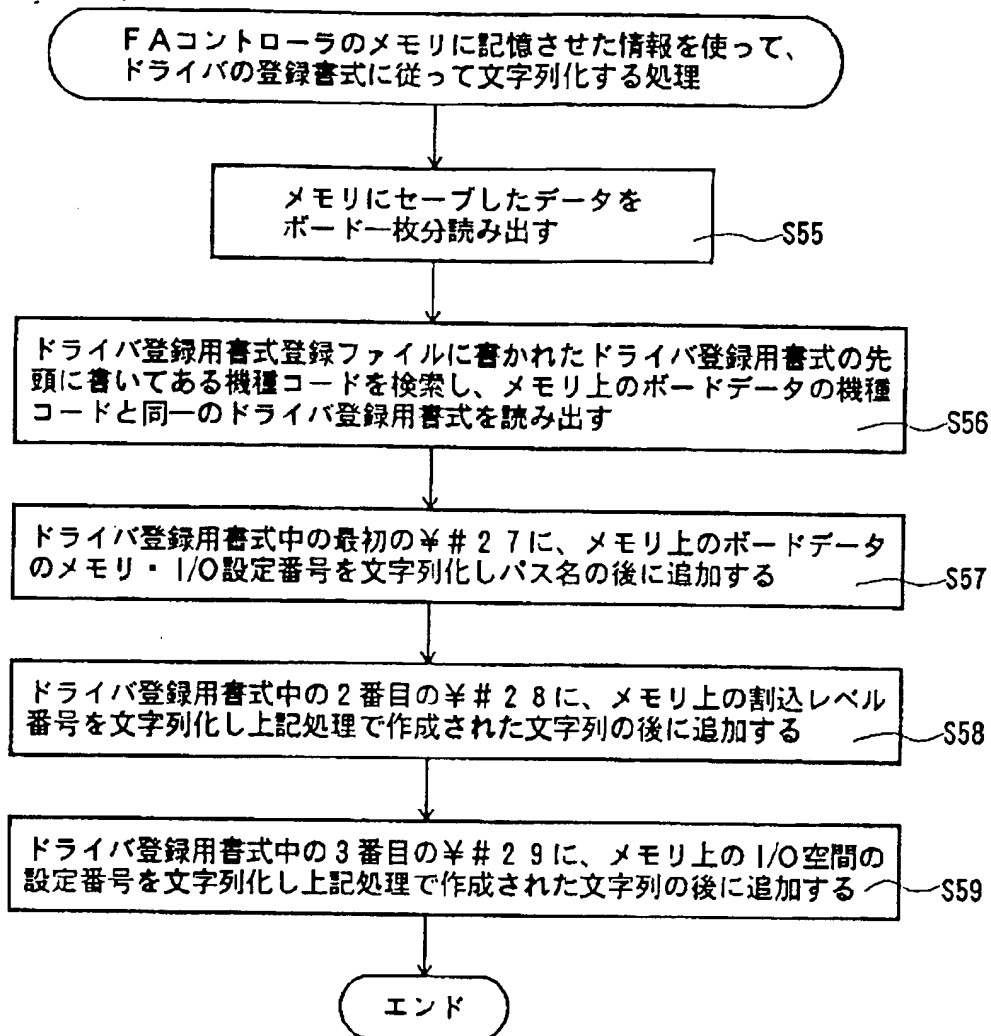
[Drawing 4]



[Drawing 5]

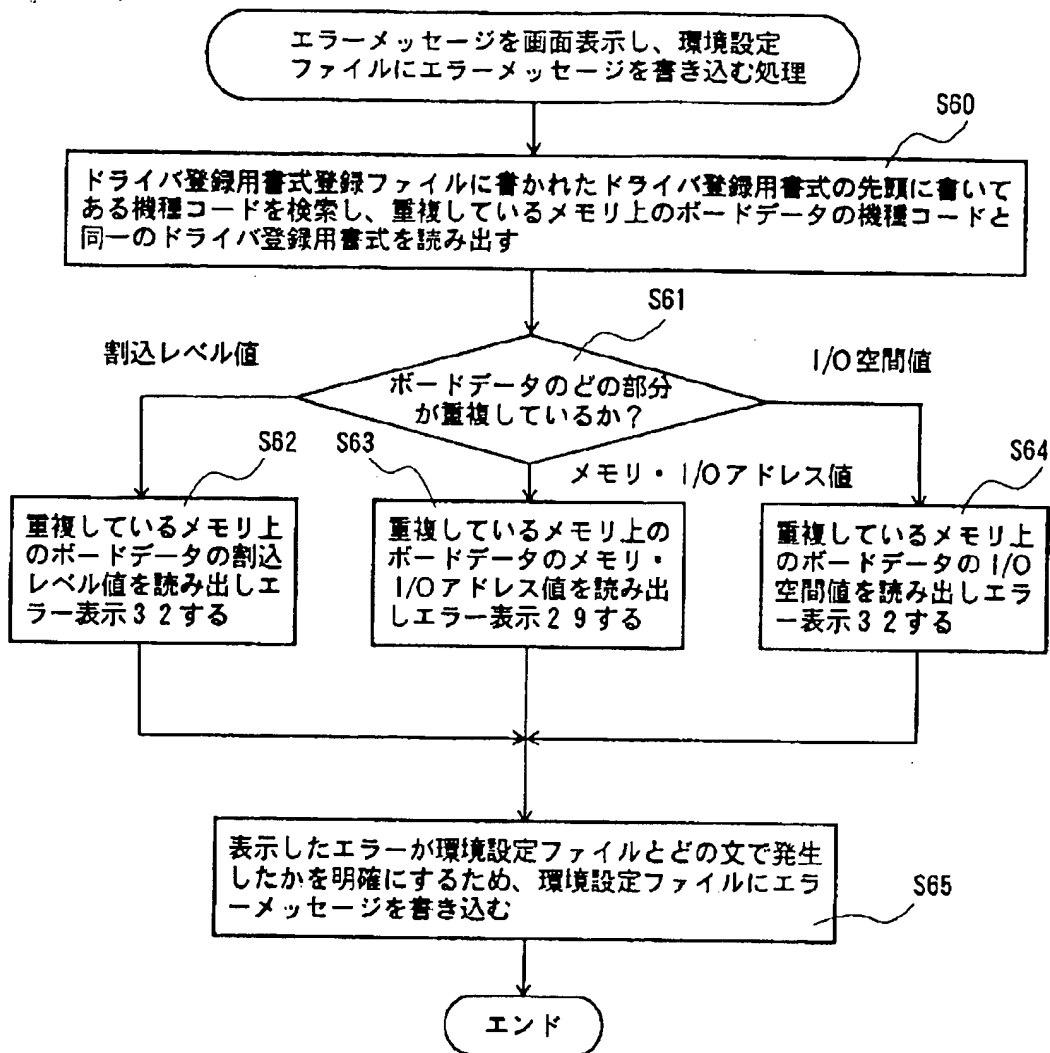


[Drawing 6]

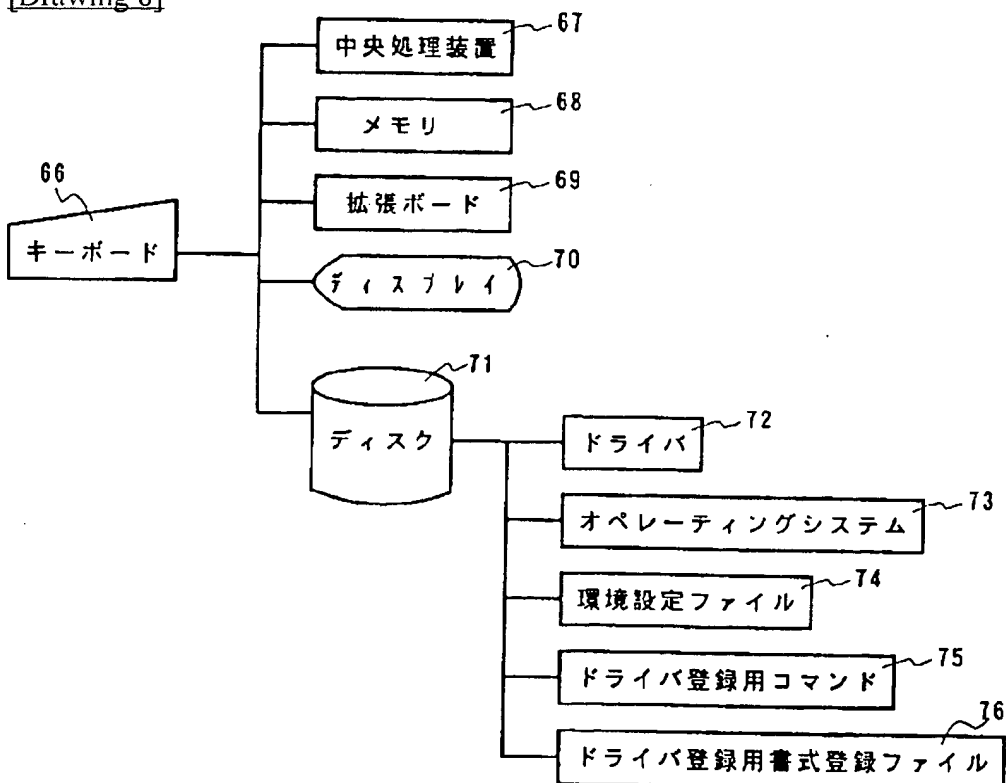


[Drawing 7]

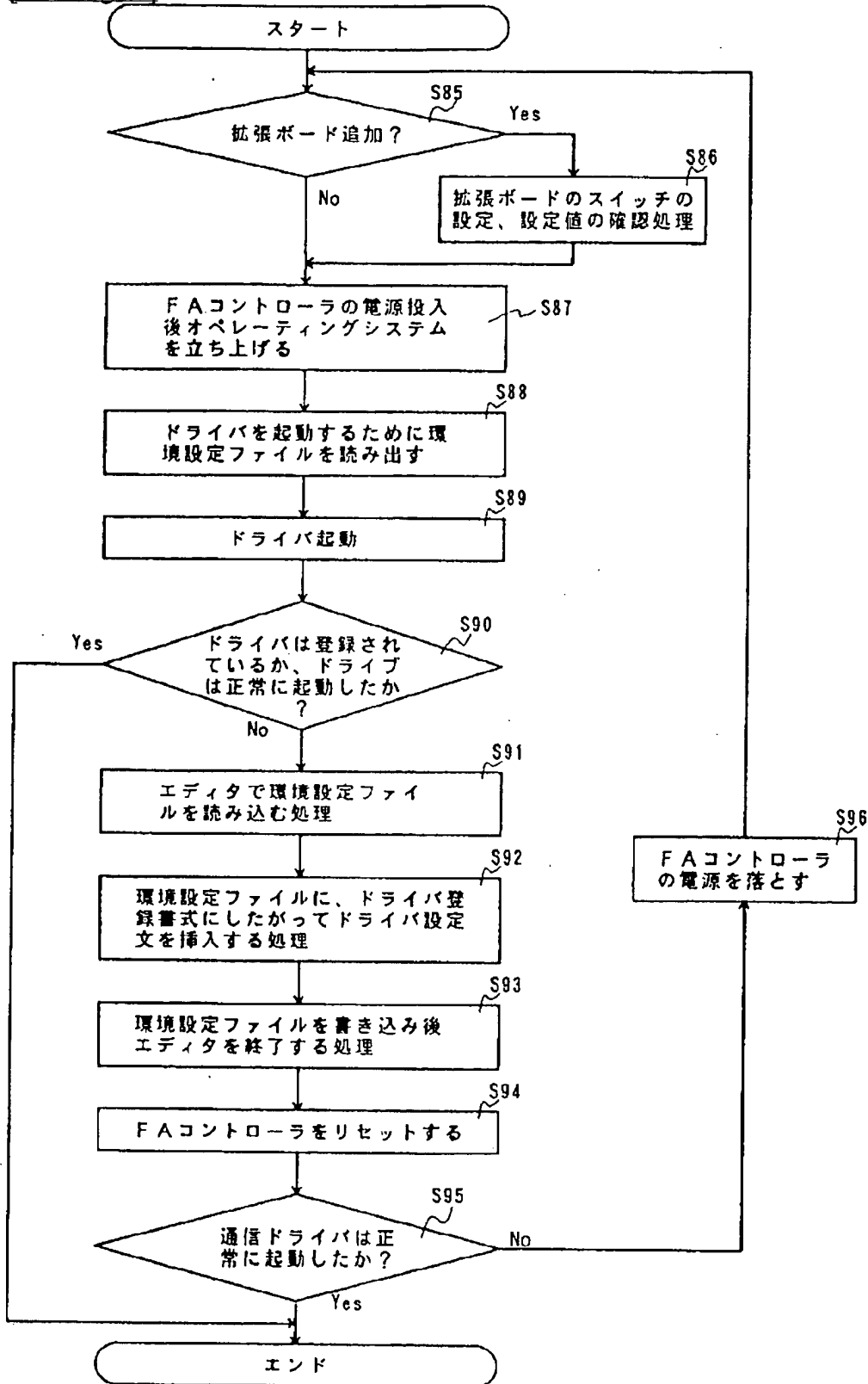




[Drawing 8]



[Drawing 10]



[Translation done.]